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(54) [Title] SPECIFIC GRAVITY SORTING MACHINE

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### Claim

In a specific gravity sorting means that has a sorting plate composed of a porous, coarse surface provided obliquely to the direction of flow of a material being sorted, a conveying means that conveys said material being sorted upward and obliquely crossing the aforementioned direction of flow, and an air blowing means that passes through the aforementioned sorting plate from below, a specific gravity sorting machine characterized in that a stone catcher formed lower as a concavity in the sorting plate at the side conveyed by the aforementioned conveying means is provided, and a removal opening is provided in the side face of said stone catcher.

### Detailed explanation of the invention

The present invention relates to an improvement to a sorting machine used for grains or beans that sorts using differences in specific gravity.

Previously, a variety of specific gravity sorting machines using both sorting plates and wind power have been proposed, and in broad terms, two types are well known. One type is an oscillating type specific gravity sorting machine in which a sorting plate composed of a coarse surface is provided inclined horizontally and in the direction of flow of the material being sorted. The material being sorted is caused to flow from one end of the sorting plate to the other end, the sorting plate is oscillated in a direction perpendicular to the direction of flow of the material being sorted as well as up and down obliquely. Those with the greater specific gravity are separated at the higher side of the other end, and those with lesser [specific gravity] or larger air resistance are separated at the lower side of the other end. The other type is a non-oscillating

intermittent air blowing type specific gravity sorting machine in which a sorting plate is provided in the same way. In place of oscillating the sorting plate, air is blow intermittently from beneath the sorting plate, and the material being sorted is conveyed up and down and sorted.

With either sorting machine, when, for example, beans and large pebbles are mixed within beans, because the specific gravity of the pebbles is large, they flow the same way as good-quality beans, they drop into the discharge outlet for good-quality beans, and foreign material becomes mixed into the good-quality beans.

In consideration of the aforementioned point, the present invention proposes to provide a specific gravity sorting machine provided with a stone removing apparatus.

An application example of the present invention is explained below based on the figures.

Figure 1 is an oblique view of one application example of the present invention, and Figure 2 is a longitudinal cross section of the major parts. 1 is a sorting plate composed of a porous, coarse surface which is slanted in the direction of flow F of the material being sorted, and which is provided with a side H which is inclined higher than side L. 2 is a sorting frame, 3 is a hopper provided above the sorting plate, and 4 is a dispersing apparatus for dispersing and supplying the material being sorted, which is supplied from the hopper, onto sorting plate 1. 5 is a discharge outlet, 5a is a discharge outlet for good product, which has a large specific gravity, 5b is a mixed product discharge outlet, and 5c is a discharge outlet for defective product, which has a small specific gravity. 6 is a stone catcher provided in sorting plate 1 adjacent to good product discharge outlet 5a, and is formed as a concavity lower than sorting plate 1. A discharge outlet 7 and a cover 8 that can open and close are provided at one side face of stone catcher 6. An air blowing means that passes through the sorting plate from below is provided below sorting plate 1. Additionally provided is a conveying means that conveys the aforementioned material being sorted in an oblique direction crossing the direction of flow by oscillating the sorting plate to cross direction of flow F of the material being sorted perpendicularly and in an oblique up and down direction W higher at side H and lower at side L, or a conveying means that conveys the material being sorted in an oblique direction crossing the direction of flow by causing the aforementioned air blowing means to blow intermittently upward and obliquely toward side H to cross the direction of flow F of the material being sorted perpendicularly.

Figure 3 shows the major parts of another application example of the present invention. A gutter 9 is connected to stone catcher 6 provided in sorting plate 1, and an opening and closing cover 10 is provided.

Note that the bottom plate 6a of stone catcher 6 in the present invention could be formed to be porous so that an air stream will pass through from below, and bottom plate 6a could also be freely slanted so that the discharge side is higher or lower.

The material being sorted which is loaded from hopper 3, beans for example, drops onto sorting plate 1 by means of dispersing apparatus 4, and is divided into good product with a high specific gravity or defective product with a low specific gravity by the sorting plate being oscillated crossing the direction of flow of the material being sorted perpendicularly, as well as up and down obliquely, so that the aforementioned material being sorted is subjected to oscillation by the conveying means to move upward obliquely crossing the direction of flow, or by the conveying means, which moves the material being sorted upward obliquely to cross the direction of flow using intermittent blowing crossing the direction of flow of the material being sorting and passing through the porous sorting plate obliquely upward. In this case, because the specific gravity of the stones is the same as that of the beans, while they flow toward good product discharge outlet 5a at the side conveyed by the aforementioned conveying means, because stone catcher 6 provided adjacent to the good product discharge outlet is formed lower than the sorting plate, [the stones] drop into stone catcher 6 and are prevented from entering good product discharge outlet 5a. When stones have accumulated in stone catcher 6 in a certain amount, cover 8 or 10 is opened and the stones are removed.

In this way, with the present invention, because a concave stone catcher is provided adjacent to the good product discharge outlet, stones of the same size as the material being sorted can be removed, and higher performance sorting can be accomplished.

#### Brief description of the figures

Figure 1 is an oblique view of an application example of the present invention, Figure 2 is a longitudinal cross section of the major parts in Figure 1, and Figure 3 is an oblique view of the major parts in another application example.

1 ... sorting plate, 2 ... sorting frame, 3 ... hopper, 4 ... dispersing apparatus, 5 ... discharge outlet, 5a ... good product discharge outlet, 6 ... stone catcher, 7 ... removal opening, 8, 10, cover, 9 ... gutter.

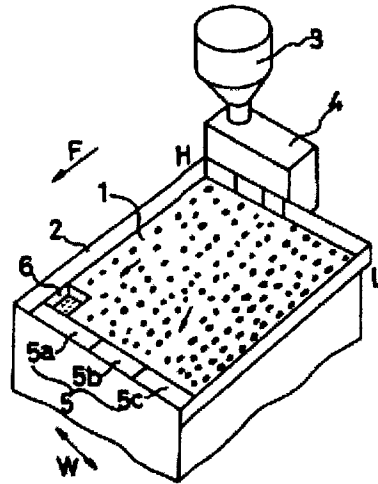


Figure 1

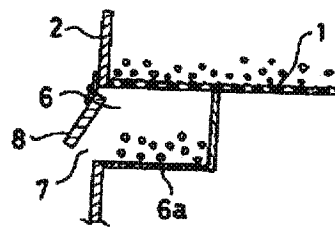


Figure 2

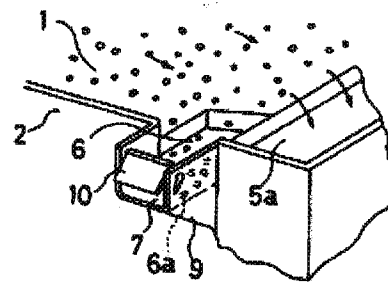


Figure 3